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CONTRIBUTIONS FROM THE GRAY HERBARIUM OF
HARVARD UNIVERSITY.—NEW SERIES, No. XLI.

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I. A REDISPOSITION OF THE SPECIES HERETOFORE
REFERRED TO LEPTOSYNE.

AMONG the numerous genera of the Helianthoid *Compositae* scarcely any has had a more involved history than the genus *Coreopsis* L., its synonymy embracing more than a score of generic names. On the one hand closely allied to the still larger genus *Bidens*, and perhaps not clearly separable from it, it is related on the other to various smaller and much more distinct genera. One group of about a dozen species, characterized by fertile rays and the presence of an annulus on the tube of the disk-flowers, has by many authors been kept distinct under the name *Leptosyne* DC., but by Bentham and Hooker,¹ Hoffmann,² and more recently by Hall,³ has been reduced to *Coreopsis*, apparently with justice. In habit, involucre, and achenes its members are closely similar to various species of genuine *Coreopsis*; and while most of the species have a thickened hairy annulus at base of throat in the disk-corollas, this is glabrous in some species⁴ and entirely absent in others,⁵ while the rays although usually fertile are sometimes sterile or neutral in the section *Pugiopappus*; so that in the absence of any quite constant diagnostic character and because of the general very close similarity, it seems advisable to follow the authorities above mentioned in referring the genus definitely to *Coreopsis*.

The genus *Coreocarpus* Bentham, on the other hand, although made a section of *Leptosyne* by Gray and included by Hoffmann in his section *Leptosyne* of *Coreopsis*, departs in its isomorphic involucre scales so

¹ Gen. Pl. ii. 385 (1873).

² In Engler & Prantl, Nat. Pfl. iv. Ab. 5. 243 (1890).

³ Univ. Calif. Pub. Bot. iii. 139 (1907).

⁴ *L. maritima*, *L. gigantea*.

⁵ *L. mexicana*, *L. insularis*; and *Electra* has no annulus.

strikingly from the distinct dimorphism of the bracts, running with considerable uniformity through the whole *Coreopsis* series, as to deserve generic rank. The bracts are imbricated in two rows, subequal and all similar, subherbaceous, and ovate, which in connection with the cymosely paniced small heads makes the genus easy of recognition.

A scapose Mexican perennial, *Leptosyne pinnata* Robinson, described from material without ripe fruit and referred to this genus with considerable doubt, proves to confirm in achenial characters the distinctness already suggested by habit and is described further on as a new genus.

The relation of the groups in question would seem to be best shown thus:

COREOPSIS L. (*κόρις* bug, and *ὄψις* likeness, from the form of the achene in the original species, *C. lanceolata* L.) Heads radiate or rarely and abnormally discoid, the flowers all yellow; rays neutral or styliferous and fertile or rarely sterile, disk-flowers mostly fertile. *Involucre double, scales of each series slightly connate at base; the inner membranaceous, 1-2-rowed, brown or yellow; the outer narrower (except in C. calliopisidea), herbaceous, usually shorter than the inner.* Receptacle flat or nearly so; pales flat, membranaceous. Ray-florets ligulate, entire or 2-3-dentate; disk-florets regular, tubular, with slightly enlarged throat and (4-)5-toothed limb, often with a thickened glabrous or pilose ring at base of throat. Anthers entire or barely bidentate at base. Style-tips truncate or with short subulate hispid appendages. Achenes obcompressed, sometimes meniscoid and much thickened on one face, orbicular to oblong, those of the ray when fertile commonly broader than the others, glabrous or pubescent, sometimes villous on the margins, wingless or with a chartaceous wing sometimes pectinately lobed, epappose or with two teeth, short ciliate scales, or glabrous or upwardly hispidulous awns or scales, or with a small cupule in place of pappus.—Herbs or rarely shrubs, glabrous or pubescent. Leaves alternate or usually opposite, undivided and entire or toothed, or ternate, or usually ternately or pinnately dissected. Heads of medium size, solitary or corymbose-paniced.—Gen. 263, no. 670 (1737), and Sp. Pl. ii. 907 (1753), in part.

Subgenus **Leptosyne** (DC.) Blake, n. comb. Rays styliferous, mostly fertile, rarely neutral in the section *Pugiopappus*; disk-flowers usually with a thickened and generally hairy annulus at base of throat.—*Leptosyne* DC. Prod. v. 531 (1836); Gray, Proc. Am. Acad. xvii. 218 (1882), Syn. Fl. i. pt. 2. 299 (1884). *Coreopsis* sect. *Leptosyne*

O. Hoffm. in Engler & Prantl, Nat. Pfl. iv. Ab. 5. 243 (1890) (excluding *Epilepis*, *Coreocarpus*, and *Acoma*).—Twelve species, ranging from California to Guatemala, chiefly Mexican.

Sect. 1. **Electra** (DC.) Blake, n. comb. Suffrutescent, with opposite oval to lanceolate coriaceous sometimes ternately parted leaves. Heads solitary or paniculate-corymbose, radiate. Outer involucreal scales about 5, oblong; inner about 8, longer, oval-oblong. Rays about 5, 2–3-dentate, oblong to elliptic, fertile, the tube pubescent; disk-flowers with pubescent tube shorter than the cylindrical-funnelform throat, and (4–)5-toothed limb; annulus none. Style-branches with subulate hispid appendages. Achenes strongly obcompressed, glabrous, margined, the outer broad, the inner much narrower, all pappusless or the inner rarely with a pair of smooth slender awns.—*Electra* DC. Prod. v. 630 (1836); Gray, Pl. Wright. i. 110, footnote (1852).—Three species of Mexico and Central America.

* Heads numerous in ternate corymbose panicles.

1. *C. MEXICANA* (DC.) Hemsl. Shrubby, nearly glabrous, 0.6–2 m. high; leaves lanceolate to lance-ovate, acute to acuminate at both ends, sharply serrate, often trifoliately cut nearly to the midrib, glabrate on both sides or retaining a sparse pubescence chiefly along the veins, the blades 4–11 cm. long, on narrowly margined petioles 1–2.5 cm. long; heads 1–1.3 cm. high, 2.5–4 cm. in diameter including rays; achenes 6–9 mm. long.—Biol. Centr.-Am. Bot. ii. 196 (1881). *Electra mexicana* DC. l. c. *Electra Galeottii* Gray, l. c. *Coreopsis Galeottii* Hemsl. l. c. 195.—In an authentic example of *E. mexicana* in the Gray Herbarium, collected by Mendez, the tube of the ray is distinctly hirtellous, and the narrowly lanceolate leaves still show a slight appressed pubescence beneath, while one of the younger heads is also sparingly hairy at the base, so that the characters relied upon by Dr. Gray in separating *E. Galeottii* entirely fail to hold. *Galeottii* 2086, represented by a fragment in the Gray Herbarium, as well as the Baites specimens cited in the original description, is practically glabrous, while *Galeottii* 2087 somewhat approaches the next form.

GUANAJUATO: “circa Villalpando ultra Guanajuato,” Mendez (COTYPE in Gray Herb.); Guanajuato, 1895, *Dugès* 472; near Cader-eyta, 22 Aug. 1905, *Rose* 9717; HIDALGO: sunny rocky slopes, Pachuca, Sept. 1905, *Purpus* 1550; clay banks, Dublan, alt. 2070 m., 15 Oct. 1902, *Pringle* 9895; Sierra de Pachuca, 2900 m., 14 Sept. 1899, *Pringle* 8218; near Metepic Station, 2530 m., 20 Sept. 1904, *Pringle* 13041; MEXICO: barranca above Santa Fe, 2600 m., 1 Sept.

1905, *Pringle* 13547; OAXACA: Cerro San Antonio, 1650 m., 26 June 1906, *Conzatti* 1431; CHIAPAS: 1864–1870, *Ghiesbreght* 133, 539 (both with panicle and under side of leaves along veins loosely pubescent); Mexico without locality: 1864, *Baites*; *Galeotti* 2086, 2087 (TYPES of *E. Galeottii* Gray, in Gray Herb.). GUATEMALA: Dept. Alta Verapaz, Dec. 1907, *Türckheim* II 2043 (large-leaved); Dept. Amatitlan, near Amatitlan, 20 July 1860, *Sutton Hayes*; Dept. Jalapa, Laguna de Ayarza, Sept. 1892, *Heyde & Lux* 3792.

1β. *C. MEXICANA* (DC.) Hemsl. var. **hyperdasys** Blake, n. var., foliis infra ubique dense pubescentibus, supra venis exceptis glabris vel scabriusculis, caulibus et gemmis et inflorescentia fuscis cum pilis tomentosis lente subglabris. — OAXACA: ravines of hills near Oaxaca, 1830 m., Sept. 1894, *Pringle* 4896 (TYPE SHEET in Gray Herb.); La Carbonera, 2165 m., 20 Sept. 1895, *L. C. Smith* 808; Cerro de San Felipe, 2000 m., 1 Sept. 1897, *Conzatti & González* 545, 546; San Juan del Estado, 18 June 1894, *L. C. Smith* 25; near Reyes, 1830–2290 m., 17 Oct. 1894, *Nelson* 1718 (approaching the next form); HIDALGO: Mineral del Monte, *C. Ehrenberg* 354.

1γ. *C. MEXICANA* (DC.) Hemsl. var. **HYPERDASYA** Blake f. **holotricha** Blake, n. forma, foliis parvis utrimque cineraceis pube densa subscabra. — PUEBLA: vicinity of San Luis Tultitlanapa, July 1908, *Purpus* 3099 (TYPE SHEET in Gray Herb.).

* * Heads long-peduncled, solitary or rarely somewhat panicked.

+- Leaves 2–5 cm. long, cuneately oblanceolate or obovate; disk-corollas 5-toothed.

2. *C. CUNEIFOLIA* Greenm. Suffrutescent, trichotomously branched, the young growth pubescent, later glabrate; leaves pale green especially beneath, with a few loose hairs when young, mucronately 5–11-toothed above the middle, tapering to a sessile margined base; heads 8–10 mm. high, 2 cm. across the rays. — Proc. Am. Acad. xl. 43 (1904). — JALISCO: dry rocky mountains above Etzatlan, 2 Oct. 1903, *Pringle* 8781; Sierra de San Estaban, near Guadalajara, 1830 m., 21 Oct. 1903, *Pringle* 11900; DURANGO: 16 Aug. 1897, *Rose* 2344.

+ + Leaves 1–2 cm. long, oval; disk-corollas 4-toothed.

3. *C. parvifolia* Blake, n. sp., fruticosa trichotome ramosa juvenile appresse pubescens denique glabrata cortice cano; foliis parvis 1–2 cm. longis ovalibus supra appresse pubescentibus infra paullum crenatis vel glabris supra partem inferiorem integram utroque ca. 5-mucronato-dentatis, summis imminutis subintegris; pedunculis solitariis ramos terminantibus 3–6.5 cm. longis subpubescentibus;

capitulis 1–1.5 cm. altis 3 cm. diametro (radiis inclusis); squamis exterioribus subcrinitis oblongo-spatulatis obtusis, interioribus oblongis obtusis apice fimbriatis (8–10 mm. longis 4–5 mm. latis); radiis ca. 5 ovalibus 13 mm. longis 8 mm. latis; corollis disci 7 mm. longis infra hirtellis 4-dentatis.—PUEBLA: dry rocky hillsides, Esperanza, Aug. 1907, *Purpus* 2581 (TYPE in Gray Herb.).

Sect. 2. **Anathysana** Blake, n. sect., herbae perennes caulibus pluribus radice lignea foliis oppositis integris vel pinnatiformibus lobis paucis filiformi-linearibus. Involucrum ut apud §1, squamis interioribus 8–12. Flosculi radii fertiles; ei disci saepius exannulati. Styli rami apice incrassati breviter appendiculati. Achenia ut apud §1, epapposa.—Type species *Leptosyne mexicana* Gray (= *C. cyclocarpa* Blake).—Three species of Mexico and Socorro Island.

* Leaves entire, linear-filiform.

4. *C. cyclocarpa* Blake, n. nom. Stems numerous from a thick woody base, 6–7 dm. high, slightly pubescent below; leaves 2–6 cm. long, entire or very rarely 3-lobed from near the middle, ciliate at base; heads rather few, long-peduncled, 6–8 mm. high, 1.5–2.5 cm. in diameter including the 8–10 rays; outer scales about half as long as inner; disk-florets exannulate.—*Leptosyne mexicana* Gray, in Wats. Proc. Am. Acad. xxii. 429 (1887), not *C. mexicana* (DC.) Hemsl. (1881).—Named from the orbicular indistinctly margined achenes, those of the ray 4.5 by 4.5 mm.—JALISCO: Rio Blanco, Sept. 1886, *Palmer* 568 (TYPE of *L. mexicana* in Gray Herb.); near Guadalajara, 10 Sept. 1890, *Pringle* 3570, 24 Sept. 1891, *Pringle* 3841, 4 Oct. 1903, *Pringle* 11546.

* * Leaves pinnately divided into 3–7 linear lobes, the uppermost sometimes entire.

+ Heads larger, inner involucre 6–8 mm. long; leaves mostly with 3 lateral pairs of lobes; disk-flowers with hairy annulus.

5. *C. pinnatisecta* Blake, n. nom. In habit, pubescence, and involucre very similar to the last; leaves 2–3 cm. long, the lobes mucronate-tipped; achenes obovate, 3.5–4 mm. long, 2.5 mm. broad.—*Leptosyne Pringlei* Rob. & Greenm. Am. Journ. Sci. ser. 3. l. 155 (1895), not *C. Pringlei* Rob. Proc. Am. Acad. xliii. 41 (1907).—OAXACA: Sierra de San Felipe, 2135 m., 7 Aug. 1894, *Pringle* 4871 (TYPE in Gray Herb.); PUEBLA: Cerro de Paxtle, near San Luis Tultitlanapa, Sept. 1909, *Purpus* 4098.

+ + Heads smaller, inner scales 4-5 mm. long; leaves mostly with 1 pair of lobes; disk-flowers exannulate.

6. *C. insularis* (Brandeg.) Blake, n. comb. Decumbent (base unknown), nearly glabrous; leaves 1-2.5 cm. long, 3-5-lobed; heads axillary and terminal, about 1.3 cm. in diameter including the small rays; outer bracts $\frac{2}{3}$ as long as inner; achene 4.2 mm. long.—*Leptosyne insularis* Brandeg. Erythea vii. 5 (1899).—SOCORRO ISLAND: March-June 1897, *Anthony* 394 (TYPE COLLECTION): 27 May-3 July 1903, *F. E. Barkelw* 223.

Sect. 3. **Tuckermannia** (Nutt.) Blake, n. comb. Stout perennials, with alternate fleshy 2-3-pinnately dissected leaves and large heads. Outer involucreal scales 5-8, lance-oblong, about equaling the inner; the latter about 12, oblong. Rays large, fertile. Disk-flowers with nearly glabrous annulus. Achenes obcompressed, glabrous, narrowly winged, epappose or rarely with margins produced into short teeth or awns.—*Tuckermannia* Nutt. Trans. Am. Philos. Soc. ser. 2. vii. 363 (1841). *Leptosyne* sect. *Tuckermannia* Gray, Bot. Calif. i. 356 (1876), & Syn. Fl. i. pt. 2. 300 (1884).—Two species of California, Lower California, and adjacent islands.

* Heads few, on very long naked peduncles, 6-8 cm. broad including rays.

7. *C. MARITIMA* (Nutt.) Hook. fil. Stems fleshy-herbaceous, spreading, 3-8 dm. high, from a thick woody base; leaf-lobes linear, 1.5-3 mm. broad; peduncles 2-5 dm. long; rays 14-20; achenes rarely with 2 teeth or awns.—Bot. Mag. t. 6241 (1876). *Tuckermannia maritima* Nutt. l. c. *Leptosyne maritima* Gray, Proc. Am. Acad. vii. 358 (1868).—Coast of San Diego County, California, northern Lower California, and adjacent islands.

* * Heads numerous, cymosely clustered toward tips of branches on peduncles mostly 1-1.5 dm. long, smaller (5-6 cm. broad).

8. *C. GIGANTEA* (Kellogg) Hall. Stems fleshy-woody, erect, 3-30 dm. high, often 1 dm. thick; leaves mostly clustered toward tips of branches; leaf-lobes finer, 1-1.5 mm. broad; rays 10-16; pappus none.—Univ. Calif. Pub. Bot. iii. 142 (1907). *Leptosyne gigantea* Kell. Proc. Calif. Acad. iv. 198 (1872).—Coast of southern California and islands, from Los Angeles County to San Luis Obispo County; also Guadalupe Island, Lower California.—A form occurs on San Nicolas Island (*Blanche Trask* 76, in part) with discoid heads, the receptacle very chaffy, the disk-florets showing dialysis of corolla with more or less complete abortion of sexual organs.

Sect. 4. **Pugiopappus** (Gray) Blake, n. comb. Annuals, branched

from the base, with 2-3-pinnatifid leaves mostly basal, and medium-sized heads solitary on long nearly naked peduncles. Outer involucre scales 5-7; inner about 8. Rays usually styliferous and fertile, sometimes neutral or with short included styles, broad and many-nerved. Disk-flowers with bearded ring. Achenes dimorphous: those of ray epappose, corky-margined and more or less corky-ridged on the faces; those of disk long-villous on margins, bearing a pair of linear-lanceolate denticulate paleae.—*Agarista* DC. Prod. v. 569 (1836), not D. Don 1834 (*Ericaceae*). *Pugiopappus* Gray, Pacif. R. Rep. iv. 104 (1857). *Leptosyne* sect. *Pugiopappus* Gray, Syn. Fl. l. c.—Two species of southern California.

* Outer scales linear-lanceolate.

9. *C. BIGELOVII* (Gray) Hall. Simple or branched below, 1-6 dm. high; leaves 5-10 cm. long, or smaller in starved specimens; outer scales 6-11 mm. long, the inner ovate, 8-12 mm. long; rays 1-2 cm. long; disk-achenes black, 6 mm. long, glabrous on both faces or slightly pubescent on inner, twice as long as the awns.—Univ. Calif. Pub. Bot. iii. 141 (1907). *Pugiopappus Bigelovii* Gray, Pacif. R. Rep. l. c. *Leptosyne Bigelovii* Gray, Syn. Fl. l. c. *P. Breweri* Gray, Proc. Am. Acad. viii. 660 (1873). *L. hamiltonii* Elmer, Bot. Gaz. xli. 323 (1906).—Southern California, not on the coast, from Tulare County to the Colorado Desert.—The annulus of the disk-flowers, in the types and other specimens examined, is very distinctly bearded, not glabrous as originally described and as repeated in the Synoptic Flora and by Hall.

* * Outer scales deltoid-ovate.

10. *C. CALLIOPSIDEA* (DC.) Gray. Rather stouter and more leafy-stemmed, with broader leaf-lobes; outer scales united for about half their length, the free deltoid tips 5-6 mm. long; inner scales 11-14 mm. long; rays 1-2.5 cm. long; disk-achenes villous on inner face, nearly equaled by their pappus.—Bot. Mex. Bound. 90 (1859). *Agarista calliopsidea* DC. Prod. v. 569 (1836). *Leptosyne calliopsidea* Gray, Syn. Fl. l. c. *L. calliopsidea* var. *nana* Gray, l. c. (a dwarfed form). *Pugiopappus calliopsidea* Gray, Proc. Am. Acad. viii. 660 (1873). *P. calliopsideus* Gray, Bot. Calif. i. 355 (1876).—Southern California, from Cholame (San Luis Obispo County) to Santa Barbara County and the Mohave Desert; north to middle California according to Hall.

Sect. 5. **Euleptosyne** (Gray) Blake, n. comb. Similar to last section in habit and involucre (outer scales linear); rays glabrous, fertile. Disk-flowers with an annulus, nearly glabrous in one species. Style-

branches enlarged at tip, short-appendaged. Achenes corky-winged, sometimes meniscoid, with a cupule in place of pappus.— *Leptosyne* sect. *Euleptosyne* Gray, Syn. Fl. i. pt. 2. 299 (1884).— Two species of Arizona, California, and northern Lower California.

* Achenes with numerous clavellate hairs on both faces; disk-corollas with bearded annulus; leaf-divisions nearly filiform.

11. *C. DOUGLASII* (DC.) Hall. Scapes solitary or few, 1–3.5 dm. high; leaves chiefly in a dense basal tuft, entire or mostly 1–2-pinnately dissected into linear-filiform lobes, 2–10 cm. long; outer involucreal scales linear, 5–8 mm. long; inner yellow, scarious-margined, multinervose, ovate, slightly longer.— Univ. Calif. Pub. Bot. iii. 140 (1907). *Leptosyne Douglasii* DC. Prod. v. 531 (1836). *L. californica* Nutt. Trans. Am. Philos. Soc. ser. 2. vii. 363 (1841). *L. Newberryi* Gray, Proc. Am. Acad. vii. 358 (1868).— Southern California and southern Arizona; also San Quentin, Lower California, 1889, *Palmer* 677.

* * Achenes without clavellate hairs, glabrous on outer face, more or less papillose on inner; annulus nearly or quite glabrous; leaf-divisions about 1–1.5 mm. broad.

12. *C. Stillmanii* (Gray) Blake, n. comb. Somewhat stouter than last, more leafy below; corky margin of achene rugose.— *Leptosyne Stillmanii* Gray, in E. Durand, Journ. Acad. Nat. Sci. Phila. iii. 91 (1855), and in Torr. Bot. Mex. Bound. 92 (1859). *L. Stillmani* Gray, Bot. Calif. i. 356 (1876).— CALIFORNIA: Calaveras Co., *Heermann*; valley of the Sacramento, *Stillman* (TYPE in Gray Herb.); hillsides, Auburn, April 1865, *Bolander* 4520; dry sand hills, Antioch, 16 April 1868–9, *Kellogg & Harford* 439; fields, Middle Tule River, 240–305 m., April–Sept. 1897, *Purpus* 5004.

COREOCARPUS Benth. (κόρις bug, and καρπός fruit, from the peculiar achenes). Heads heterogamous, radiate, the flowers all yellow; rays styliiferous, fertile, disk-flowers mostly fertile. Involucreal scales 5–8, 2-rowed, subequal, submembranaceous, dark-lineate, ovate to ovate-oblong, the outer obtusish, the inner acuminate; heads sometimes with a few bractlets at base. Receptacle flat, with narrow membranaceous pales subtending the flowers. Ligules small, 4–5-nerved, entire or emarginate; disk-corollas regular, tubular, with slightly enlarged funnelform throat and 5-toothed limb, with a hairy annulus at base of throat. Style-branches with subulate hispid appendages. Anthers entire at base. Achenes obcompressed, with an

entire or pectinately cut crustaceous wing, calvous or with two retrorsely hispidulous slender awns, often granular on one or both faces. — Annuals or suffrutescent perennials, with opposite 1–2-pinnately divided leaves, and small slender-peduncled heads (less than 2 cm. in diameter including the rays) in somewhat ternate cymose clusters at the ends of the branches.— Bot. Voy. Sulph. 28, t. 16 (1844); Gray, Proc. Am. Acad. v. 162 (1861). *Acoma* Benth. l. c. 29, t. 17 (1844). *Leptosyne* sect. *Coreocarpus* Gray, Syn. Fl. i. pt. 2. 301 (1884).— Three species of the Sonoran region.— Well distinguished by inflorescence, and by the involucre of few similar scales, not double as in all members of the genus *Coreopsis*.

* Herbaceous annuals.

1. *C. PARTHENIOIDES* Benth. Slender, 2–4 dm. high, branched above, nearly glabrous, bearing few heads in somewhat ternate terminal clusters; leaf-blades 2–4.5 cm. long on petioles nearly as long, somewhat thickish, bipinnatifid, the primary lobes deltoid, 1–2 cm. long, nearly as broad, entire or 3–4-lobed with broad divisions; heads 5–6.5 mm. high, about 1 cm. broad including the rays; rays oval, about 5, 5 mm. long, yellow, often drying whitish with purplish veins; achenes oblong, crenate-margined, in the only specimens examined; figured by Benthham as oval, shortly 2-awned, with imperfectly dissected wing.— Bot. Voy. Sulph. 28, t. 16 (1844). *Leptosyne parthenioides* Gray, l. c.— Benthham's type came from Bay of Magdalena, Lower California. The only specimens examined are: SONORA: high in the mountains, Guaymas, Oct. 1887, Palmer 299.

1β. *C. PARTHENIOIDES* Benth. var. **heterocarpus** (Gray) Blake, n. comb. Leaves bi-tripinnatifid with finer divisions, the ultimate ones nearly linear; margin of achenes entire and incurved or dissected into lobes; awns sometimes present.— *Coreocarpus heterocarpus* Gray, Proc. Am. Acad. v. 162 (1861). *Leptosyne heterocarpa* Gray, Syn. Fl. l. c. *L. dissecta* Gray, l. c. (as to plant, not synonym). *L. parthenioides* var. *dissecta* Wats. Proc. Am. Acad. xxiv. 56 (1889), as to plant cited, not as to name-bringing synonym. *Coreocarpus involutus* Greene, Pittonia, i. 290 (1889).— While *C. heterocarpus* Gray appears to be merely a form of *C. parthenioides*, as long ago suggested by Dr. Watson, indistinguishable by achenial characters alone, it nevertheless differs sufficiently in foliar characters to retain varietal rank. *C. involutus* Greene, of which no authentic specimen has been seen, is judging from the description inseparable from this variety. Plants collected by Brandegee on Natividad Island and distributed as this

species are slightly stouter and more pubescent than any other specimens examined but show no essential differences.—LOWER CALIFORNIA: Lagoon Head, Mar. 1889, *Palmer* 795; Natividad Island, 10 April 1897, *Brandege*; Cape San Lucas, &c., Aug. 1859–Jan. 1860, *Xantus* 62 (TYPE of *C. heterocarpus*); San José del Cabo, 8 Mar. 1892, *Brandege* 339; La Paz, 20 Jan.–5 Feb. 1890, *Palmer* 19; Santa Agueda, 4–6 Mar. 1890, *Palmer* 248; mountain sides, Los Angeles Bay, Dec. 1887, *Palmer* 660; Lower California, without locality, *Dr. Street*.

* * Suffrutescent perennials.

+- Achene-wing pectinately dissected.

2. *C. arizonicus* (Gray) Blake, n. comb. Much branched from a woody base, nearly or quite glabrous; leaves 7–10.5 cm. long, pinnately divided into 3–5 linear lobes 1–3 mm. wide; heads rather numerous in paniced few-headed cymes; involucre scales 5–6 mm. long; rays 5–6, 7 mm. long; achenes with the wing split into flattened cuneate lobes, the inner achenes narrower; retrorsely spinulose awns sometimes present.—*Leptosyne* (*Coreocarpus*) *arizonica* Gray, Proc. Am. Acad. xvii. 218 (1882). *Coreopsis arizonica* O. Hoffm. in Engler & Prantl, Nat. Pfl. iv. Ab. 5. 243 (1890).—ARIZONA: along streams, Ft. Lowell, Aug. 1880, *Lemmon* (COTYPE); by streams of the Santa Catalina Mts., 760–1060 m., April 1881, *Pringle* (COTYPE); Santa Catalina Mts., May 1881, *Lemmon* 211; mountains, Lowell, 8 May 1884, *W. F. Parish* 112. SONORA: Touibabi, 18 Nov. 1890, *F. E. Lloyd* 407; Alamos, 1890, *Palmer* 384 (approaching the next form); CHIHUAHUA: southwestern part, 1885, *Palmer* 294.

2β. *C. ARIZONICUS* (Gray) Blake var. **pubescens** (Rob. & Fern.) Blake, n. comb. Whole plant pubescent with short rather soft hairs.—*Leptosyne arizonica* var. *pubescens* Rob. & Fern. Proc. Am. Acad. xxx. 118 (1894).—SONORA: Granados, 905 m., 15 Nov. 1890, *Hartman* 222; Huchuerachi, 1220 m., 5 Dec. 1890, *Hartman* 296; Agnos Blanco, 9 Dec. 1890, *Lloyd* 406.

2γ. *C. ARIZONICUS* (Gray) Blake var. **filiformis** (Greenm.) Blake, n. comb. Leaf-lobes linear-filiform, less than 1 mm. wide, the lower 4–6 cm. long.—*Leptosyne arizonica* var. *filiformis* Greenm. Proc. Am. Acad. xl. 44 (1904).—SINALOA: Sierra de Choix, 80 km. NE. of Choix, 15 Oct. 1898, *Goldman* 258 (COTYPE in Gray Herb.).

+- Achene-wing thick, often rugose, entire or barely crenulate; leaves fleshy, bipinnatifid.

3. *C. dissectus* (Benth.) Blake, n. comb. Suffrutescent, trichotomously branched, glabrous; leaves mostly crowded near the base of

the young branches, 1-2-pinnatifid, 1.5-2.5 cm. long, ternately cut into short fleshy linear lobes, on petioles nearly as long; heads cymosely arranged in nearly naked panicles, as large as those of last species; achenes 4 mm. long, 2.5 mm. broad.—*Acoma dissecta* Benth. Bot. Voy. Sulph. 29, t. 17 (1844). *Leptosyne dissecta* Gray, Syn. Fl. i. pt. 2. 301 (1884), as to synonym. *L. parthenioides* var. *dissecta* Wats. Proc. Am. Acad. xxiv. 56 (1889), as to synonym only.—Bentham's type came from Cape San Lucas. The only specimens examined are three sheets from Magdalena Island, LOWER CALIFORNIA, collected 12 Jan. 1889 by *Brandeg* (see Brandeg. Proc. Calif. Acad. ser. 2. ii. 176 (1889)).

3β. *C. DISSECTUS* (Benth.) Blake var. **longilobus** Blake, n. var., foliis 5-7.5 cm. longis pinnatifimbriatis, segmentis (3-5) lineari-fimbriatis, lobis inferioribus 2-3 cm. longis 3-5-lobatis; acheniis ut in forma typica sed margine crenulatis.—LOWER CALIFORNIA: Carmen Island, 1-7 Nov. 1890, *Palmer* 877 (TYPE SHEET in Gray Herb.; distributed as *L. dissecta* Gray).

STEPHANOPHOLIS Blake, n. genus Compositarum Coreopsi-dearum (στέφανος crown, and φολις scale). Capitula heterogama radiata, radiis fertilibus. Involucrum duplex squamis liberis, exterioribus 5-6 herbaceis obtusis ovato-lanceolatis; interioribus circa 8 submembranaceis ellipticis atroviridibus apice rotundatis margine angustoscario fimbriatulo exteriores subaequantibus. Receptaculum conicum, paleis planis membranaceis flavis apice rotundatis. Radii corollae ca. 12 ligulatae oblongae tridentatae supra albae infra atroplumbeae glabrae obscure ca. 8-nervatae. Disci corollae flavae glabrae exanulatae 5-dentatae tubulo brevis. Antherae basi subintegrae apice appendice deltoideo munitae. Styli rami apice incrassati. Achenia dimorpha: ea radii valde obcompressa ovalia glabra epapposa; disci paullo crassiora oblonga supra appresse pubescentia, pappo coroniformi e squamis brevissimis inaequalibus lacerato-fimbriatis vix junctis ad angulos plus minusve exaggeratis composito.—Herbae perennes scaposae pratensis radice fasciculata caulibus a foliorum basibus fibrillosis persistentibus lanugine brunnea intermixta vestitis. Folia multa longa integra vel pinnatifolia. Scapi pauci nudi vel 1-2-bracteati capitula solitaria majuscula radiis albidis gerentes. Genus habitu pappo clinio conico bene distinguitur. Type species *Leptosyne pinnata* Rob.—One species with a variety, in mountain meadows of southern Mexico.

1. *S. pinnata* (Rob.) Blake, n. comb. Smooth except base and scapes; leaves 1-3.5 dm. long, with 3-6 pairs of small oblong lobes and a much enlarged slightly glandular-crenulate terminal one 3.5-9.5 cm. long; scapes very rarely branched, densely appressed-pubescent above, exceeding the leaves; head about 1 cm. high, 3 cm. broad including the rays.—*Leptosyne pinnata* Rob. Proc. Am. Acad. xxvii. 176 (1892).—MEXICO: wet meadows, Del Rio, 30 Aug. 1890, *Pringle* 3668 (TYPE in Gray Herb.); wet meadows, Valley of Toluca, 19 Aug. 1892, *Pringle* 4194; wet alpine meadows, Sierra de las Cruces, 2990 m., 28 Aug. 1904, *Pringle* 13067.

1β. *S. PINNATA* (Rob.) Blake var. *integrifolia* (Greenm.) Blake, n. comb. Leaves entire, narrowly lanceolate, only very slightly crenulate, 1.5-2 dm. long; pappus slightly more developed.—*Leptosyne pinnata* var. *integrifolia* Greenm. Proc. Am. Acad. xl. 44 (1904).—DURANGO: near El Salto, 12 July 1898, *Nelson* 4580 (COTYPE in Gray Herb.).

II. A REVISION OF ENCELIA AND SOME RELATED GENERA.

In the course of a revision of the genus *Encelia*, as at present understood, it has been found necessary for clearness of definition to remold the group by the reference of a number of species to the related genera *Viguiera*, *Flourensia*, and *Verbesina*, and by the recognition of several genera long treated as synonymous; and in view of the changes in generic boundaries involved it seems desirable to consider briefly the history of some of these related genera and to contrast their characters.

Only two genera of this immediate relationship were known to Linnaeus. *Helianthus*, characterized by its thickish achenes with promptly deciduous pappus of paleaceous awns and sometimes also squamellae (short intermediate scales), is today taken in its original interpretation, save that the small and very distinct genus *Heliopsis* was later erected by Persoon on one of the original species (*H. laevis*). The Linnaean genus *Verbesina*, on the other hand, was very composite, its ten original species (reducible to nine or eight) representing seven modern genera, two only of the species being now included in the genus. It is well distinguished by the generally fertile rays and the chartaceo-cartilaginous wings of the flat achene, but these being usually invisible or indistinct in the ovary young material is easily

Errata.

Page 336, line 20; for *calliopisidea* read *calliopsidea*.

“ 353, “ 37; for + Heads larger, rays 2-4.5 cm. read
+ + Heads larger, rays 2-4.2 cm.